

## **ATTACHMENT B**

### **LHMP ANNEX City of Palo Alto**

#### **INTRODUCTION**

Palo Alto is a community of approximately 61,200 residents. Part of the metropolitan San Francisco Bay Area and the Silicon Valley, Palo Alto is located within Santa Clara County and borders San Mateo County.

The City's boundaries extend from San Francisco Bay on the east to the Skyline Ridge of the coastal mountains on the west, with Menlo Park to the north and Mountain View to the south. The City encompasses an area of approximately 26 square miles, of which one-third is open space.

The blend of business and residential neighborhoods anchored by a vibrant downtown defines Palo Alto's unique character. A charming mixture of old and new, Palo Alto's tree-lined streets and historic buildings reflect its California heritage. At the same time, Palo Alto is recognized worldwide as a leader in cutting-edge technological development.

Unique among California cities, Palo Alto is a full-service municipality that owns and operates its gas, electric, water, sewer, refuse and storm drain services.

#### **THE PLANNING PROCESS**

The City has a Safety Element to its Comprehensive Plan last updated in 1999 that includes a discussion of earthquake, fire, flooding, and land slide hazards. In addition the City routinely enforces the requirements of the California Environmental Quality Act (CEQA). The City's effort has focused on building on these existing programs and identifying gaps that may lead to disaster vulnerabilities in order to work on ways to address these risks through mitigation.

Many of the activities conducted by the City were fed into the planning process for the multi-jurisdictional plan. The City participated in various Association of Bay Area Governments (ABAG) workshops and meetings. In

addition, the City has provided written and oral comments on the multi-jurisdictional plan. Finally, the City provided ABAG with information on facilities that are viewed as “critical”.

Key City staff met on several occasions to identify and prioritize mitigation strategies appropriate for the City. Existing mitigation programs and policies already underway were also identified and included in the plan.

The City provided the opportunity for the public to comment on the DRAFT annex and mitigation strategies during the month of September (on the City web site) and at the City Council meeting on December 12, 2005. The City Council adopted the resolution and the plan at that same meeting.

## **HAZARD AND RISK ASSESSMENT**

The ABAG multi-jurisdictional Local Hazard Mitigation Plan, to which this is an Annex, lists nine hazards that impact the Bay Area, five related to earthquakes (faulting, shaking, earthquake induced landslides, liquefaction, and tsunamis) and four related to weather (flooding, landslides, wildfires and drought) These hazards also impact this community, except for tsunami.

Palo Alto is located in a very geologically active part of the world. The San Andreas Fault – long considered the major seismic risk in California – passes through the community. The fault is believed capable of producing a magnitude 8.4 earthquake. This would cause very violent ground shaking in much of Palo Alto, with fault rupture possible along the San Andreas, Monte Vista, and Hermit Faults, and other fault traces around the Stanford University Campus.

Probably the greatest hazards are associated with fault rupture and ground shaking, although liquefaction hazards are significant in the area east of Highway 101 due to the porous nature and high water content of the soil. While the City has undertaken a number of general hazard mapping activities since the first Comprehensive Plan safety element was prepared, these maps are less detailed and are not as current as those shown on the ABAG website at <http://quake.abag.ca.gov/mitigation/>

Other geologic hazards in Palo Alto may or may not be associated with seismic events. Land sliding may result from heavy rains, erosion, removal of vegetation, or human activities. It is a common hazard in the foothills and

its severity depends on slope, soil and underlying geology. Landslide hazards are increased during earthquakes, particularly if the ground is saturated. Seismically induced flooding is a hazard due to the possibility of dam failure at Felt Lake, Searsville Lake and Lagunita Reservoir, and the potential for levee failure near the bay.

Limited areas of Palo Alto are subject to flooding following unusually heavy rainfall. Flooding can occur due to the overtopping of creek banks during large storms and/or the overtopping or failure of Bayfront levees during exceptional high tide events. Most of the City is outside the 100-year flood plain boundary defined by the Federal Emergency Management Agency (FEMA). However, a substantial area is subject to flooding in a 100-year storm and is designated as a Special Flood Hazard Area on FEMA's Flood Insurance Rate Map.

Fire hazards are primarily associated with homes built in the foothills and in other areas where urban and wild land activities interface. The risk of fire is highest during the summer and autumn months when temperatures are high and humidity is low. The amount of risk is influenced by access, resident population, topography, response time, availability of water, exposure to wind, and type of vegetation. The Fire Department operates 7 fire stations through out the City and on the Stanford Campus. An eighth fire station is staffed in the foothills during the high fire season.

Palo Alto conducts emergency preparedness planning on an on-going basis. Police and Fire Departments are assigned the major responsibilities, and various locations around the City are designated for shelter and emergency operations. All City departments have emergency plans and many have significant roles in restoring infrastructure and City services, providing shelter and welfare services, and coordinating communication. An Emergency Management Plan includes specific provisions for pre-emergency planning and post-disaster recovery.

Information on past disasters declared in Santa Clara County is available at: <http://quake.abag.ca.gov/mitigation/disaster-history.html>

The City examined the hazard exposure of land within its boundaries, based on the information on ABAG's website at

<http://quake.abag.ca.gov/mitigation/pickdbh2.html>.

Of the 15,293 acres in the City,

- Earthquake faulting – Although the San Andreas fault runs through the city it is in an open space area;
- Earthquake shaking - 12,167 acres are in the highest two categories of shaking potential, in large part because the San Andreas fault runs through the western part of the City;
- Earthquake-induced landslides – The California Geological Survey has not completed mapping of this hazard, however, 890 acres are in areas of potential landslides;
- Earthquake liquefaction - 6,978 acres are in areas of moderate, high or very high liquefaction susceptibility;
- Tsunamis – Since Palo Alto is not on the coast the potential for tsunami damage is believed to be low;
- Flooding - 2,806 acres are in the 100 year flood plain;
- Wildfires - 3,296 acres are subject to high or very high wild fire threat and 4,891 acres are in wild land-urban interface threat areas;
- Dam Inundation - 3,411 acres are subject to dam inundation;
- Drought – All 15,293 acres are subject to drought.

The City also examined the hazard exposure of infrastructure based on the information on ABAG's website at:

<http://quake.abag.ca.gov/mitigation/pickdbh2.html>

Of the 274 miles of roadway in the City,

- Earthquake faulting – Less than 1 mile of roadway is subject to fault rupture;
- Earthquake shaking - 173 miles of roadway are in the highest two categories of shaking potential;
- Earthquake-induced landslides - 2 miles of roadways are in areas of potential landslides;
- Earthquake liquefaction - 195 miles of roadway are in areas of moderate, high or very high liquefaction susceptibility;
- Tsunamis – Palo Alto is not on the coast and tsunami potential is believed to be low;
- Flooding - 60 miles of roadway are in the 100 year flood plain while an additional 16 miles are in other flood prone areas;
- Wildfires - 19 miles of roadway are subject to high, very high, or extreme wild fire threat;
- Dam Inundation - 97 miles of roadway are in areas subject to dam inundation;

- Drought – is not a hazard for roadways

Finally, the City examined the hazard exposure of critical health care facilities, schools, and city-owned buildings based on the information on ABAG's website at:

<http://quake.abag.ca.gov/mitigation/pickcrit.html>

Of the critical facilities in the City,

- Earthquake faulting – No critical facilities are in areas subject to fault rupture;
- Earthquake shaking – 8 schools, 13 health care facilities, and 43 government owned buildings are in the highest two categories of shaking potential;
- Earthquake-induced landslides – The California Geological Survey has not completed mapping of this hazard in the City of Palo Alto. However, this is unlikely to be an issue because no critical facilities are in existing landslide areas;
- Earthquake liquefaction – 15 health care facilities, 18 schools and 41 government owned buildings are located in areas of moderate, high or very high liquefaction susceptibility;
- Tsunamis - Palo Alto is not on the coast and tsunami potential is believed to be low;
- Flooding – 1 health care facility, 5 schools and 11 government owned buildings are located in the 100 year flood plain;
- Landslides – No health care facilities, schools, or government owned building are located in existing landslide areas;
- Wildfires – 11 healthcare facilities, 10 schools, and 25 government owned buildings are located in the wildland-urban interface threat areas;
- Dam Inundation – 11 health care facilities, 8 schools, and 20 government owned buildings are in an area subject to dam failure inundation;
- Drought – Drought will not affect buildings directly. However, the city does operate a water supply distribution system.

In spite of the areas of the City located in flood-prone areas, there are no repetitive loss properties in the City based on the information at:

<http://quake.abag.ca.gov/mitigation/pickflood.html>.

The City plans to work with ABAG during 2005 to improve the risk assessment information being compiled by ABAG by providing information on unreinforced masonry buildings and soft story apartments located in the City.

Drought, though a potential problem in the City, is not fully assessed. The City will work with ABAG and various water supply agencies on this issue.

The City plans to work with ABAG to develop specific information about the kind and level of damage to buildings, infrastructure, and critical facilities which might result from any of the hazards previously noted. The ABAG Annex states that ABAG will be doing this work in 2005 through early 2006.

As these impacts are not fully developed, The City has reviewed the hazards identified and ranked the hazards based on past disasters and expected future impacts. The conclusion is that earthquakes (particularly shaking), flooding and wildfire pose a significant risk for potential loss.

### **Mitigation Activities and Priorities**

As a participant in the ABAG multi-jurisdictional planning process, City staff helped in the development and review of the comprehensive list of mitigation strategies in the overall plan. The list was discussed at several meetings of the Assistant City Manager, Fire Chief, Police Chief, Public Works Director, Director of Planning and Community Environment, Director of Utilities, Assistant City Attorney, and the Building Official. In addition, a representative of the Palo Alto Unified School District also attended. At the meetings, all of the mitigation strategies were discussed. The tentative decision on priority was made based on a variety of criteria, not simply on an economic cost-benefit analysis. These criteria include being technically and administratively feasible, politically acceptable, socially appropriate, legal, economically sound and not detrimental to the environment or our heritage.

Over time, we are committed to developing better hazard and risk information to use in making those trade-offs. We are not trying to create a disaster proof City, but a disaster resistant one. In addition, several of the mitigation strategies are existing City programs.

These draft priorities were submitted to the City Manager for review. The draft priorities were then provided to the City Council on December 12, 2005. The public was provided with an opportunity to comment on the draft priorities at that time.

### **The Plan Maintenance and Update Process**

The City Manager's Office will ensure that monitoring of this Annex will occur. The plan will be monitored on an on-going basis. However, the major disasters affecting our community, legal changes, notices from ABAG as the lead agency in this process, and other triggers will be used. Finally, the Annex will be a discussion item on the agenda of the City Executive Staff (Department Heads) at least once a year in April. At that meeting, the department heads will focus on evaluating the Annex in light of technological and political changes during the past year or other significant events. This group will determine if the plan should be updated.

The City of Palo Alto is committed to reviewing and updating this plan annex at least once every five years, as required by the Disaster Mitigation Act of 2000. The City Manager will contact ABAG four years after this plan is approved to ensure that ABAG plans to undertake the plan update process. If so, the City again plans to participate in the multi-jurisdictional plan. If ABAG is unwilling or unable to act as the lead agency other agencies will be contacted, including the County's Office of Emergency Services. Counties should then work together to identify another regional forum for developing a multi-jurisdictional plan.

The public will continue to be involved whenever the plan is updated, and as appropriate during the monitoring and evaluation process. Prior to adoption of updates, the City will provide the opportunity for the public to comment on the updates. A public notice will be posted prior to the meeting to announce the comment period and meeting logistics.